

# CEDER

Center for  
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## Columbia/Snake River System and Oregon Coastal Cargo Ports Marine Transportation System (MTS) Study

### **Final Report** **June 2005**

*Prepared for:*

CEDER  
(Center for Economic Development and Research)

*by:*

PB Ports and Marine,  
A Division of Parsons Brinckerhoff  
Portland, Oregon

BST Associates  
Bothell, Washington

Pacific Northwest Waterways Association  
Portland, Oregon

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# **Columbia/Snake River System and Oregon Coastal Cargo Ports Marine Transportation System Study**

## **Why a Marine Transportation System for the Columbia/Snake River and Oregon Coastal Cargo Ports?**

Exporters, importers and transportation providers increasingly demand a highly integrated multimodal freight transportation system to meet the stringent requirements of today's supply chain logistics and just-in-time delivery needs. By eliminating time consuming and costly inefficiencies from the system, the region's and the nation's trade is more competitive in the global market and environmental and social benefits are increased at home

A Marine Transportation System (MTS) plan for the Columbia/Snake River System and Oregon Coastal Cargo Ports promotes regional transportation infrastructure investments that are coordinated and developed with this integrated multimodal concept in mind. The elements of the Marine Transportation System to be integrated include:

- **Navigation infrastructure** – Deep draft and inland navigation channels, anchorages, turning basins, upriver dam locks, and jetties to accommodate increasingly larger ships and growing inland barge movements.
- **Rail infrastructure** – Mainline and shortline trackage, industrial lead trackage, staging, storage and bypass tracks, higher speed rail junctions, and bridges, tunnels and grade separations to accommodate unit trains and other rail operations connected to ports.
- **Roadway infrastructure** – Federal and state highways, local roadway connections, grade separations, bridges, and tunnels to accommodate truck and vehicle traffic serving ports.

Each of the transportation modes in the MTS contributes in valuable ways to the trade moving to, from and through the region:

- **Deep water navigation** is the common denominator of the MTS, benefiting cargo and trade movement to and from local, regional and national markets.
- **The roadway system** supports locally and regionally generated trade, where population and economic growth have resulted in congestion issues and freight mobility has become critical.
- **Inland navigation** supports trade in important regional industries – primarily to and from the Inland Empire – with clean, cost-effective barge transportation.
- **Rail transportation** is critical for regional and national cargo and trade flows, supporting growth and vitality in the national economy.

All modes are critical; all are part of an integrated transportation system; and the goal of the MTS is to ensure that the region continues to “fire on all four cylinders”.

The integrated multimodal development of MTS infrastructure benefits companies throughout the region and across the nation that trade in agricultural products, forest products, manufactured goods, automobiles, containerized products and bulk materials moving to, from and through the

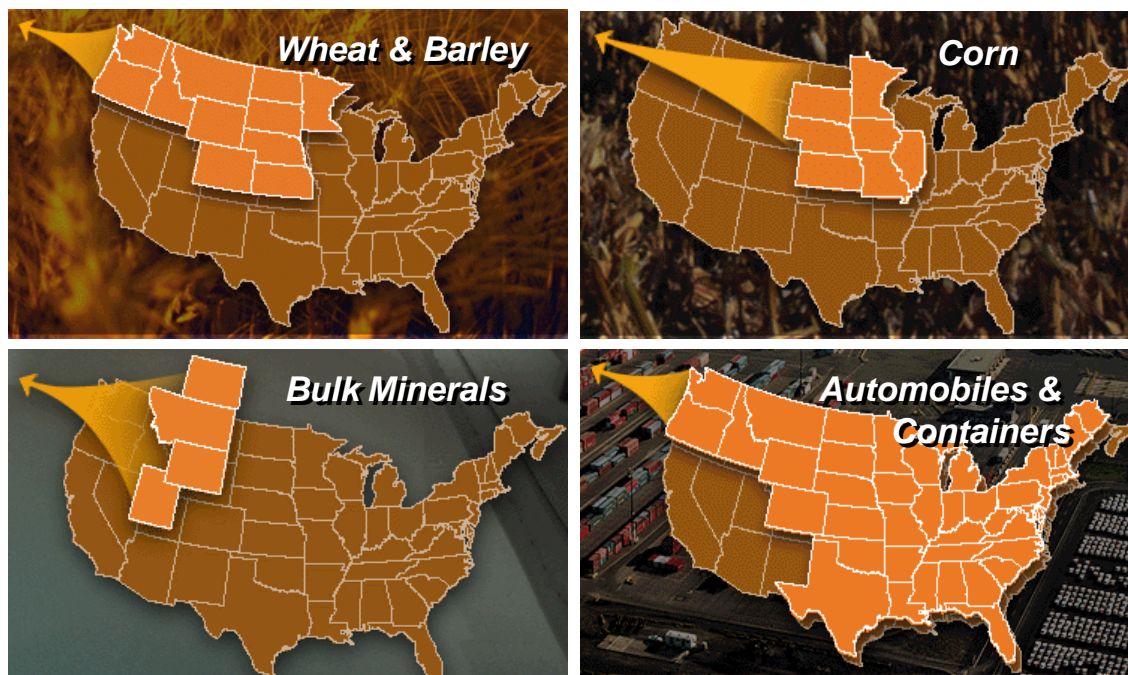
Columbia/Snake River System and Oregon Coastal Cargo Ports region. In addition, increased transportation system efficiencies benefit environmental and social goals by reducing congestion, highway maintenance requirements, and air pollution.

### ***Regional and National Significance of the Columbia/Snake River System and Oregon Coastal Cargo Ports***

Geography, history and development have combined to make the Columbia/Snake River System and Oregon Coastal Cargo Ports region a natural marine transportation gateway to off-shore markets for the Pacific Northwest and key industries across the entire northern tier of the country. This system is a uniquely valuable regional and national transportation resource because, unlike any other location on the West Coast, it integrates transportation options via deep water shipping, river barging, two water-grade rail mainlines and the interstate highway system into a multimodal, low-cost and high-capacity Marine Transportation System (MTS). Total trade through the Columbia/Snake River System and Oregon Coastal Cargo Ports amounted to \$15 billion in value in 2003.

The Columbia/Snake River System and Oregon Coastal Cargo Ports region is a critical regional and national gateway linking agricultural, mineral and goods production across the Northwest, Midwest and Mountain states to growing markets in the Pacific Rim. With water grade rail routes through the Cascade Mountains, this system is the least-cost barge and rail route for this traffic to reach deep water shipping, where ocean transit to Asia is one day faster than from California and 10 days faster than from the U.S. Gulf.

#### **Regional and National Markets Served by the Columbia/Snake River System & Oregon Coastal Cargo Ports**



Source: Port of Portland

This MTS system is particularly important to the global competitiveness of one of America's strategic industries – grain production. The Columbia River is the leading export gateway for U.S. wheat and barley. Pacific Northwest grains are competitive in Asia largely by virtue of the low-cost rail and barge routings available via the Columbia River corridor. Likewise, by focusing on unit train rail routings through the Columbia River for Midwest grains, as an alternative to rail or barge routings through the Gulf, U.S. grain producers can be more competitive with Australia, Argentina and Brazil in Asian markets.

#### **Columbia/Snake River System Grain Rankings**

| Commodity | Ranking    | Percent of Exports |
|-----------|------------|--------------------|
| Wheat     | #1 in U.S. | 37% of U.S.        |
| Barley    | #1 in U.S. | 97% of U.S.        |

Source: Department of the Army, Corps of Engineers, Institute for Water Resources, 2003 Waterborne Commerce Statistics

The Columbia/Snake River System and Oregon Coastal Cargo Ports region is the leading bulk cargo and forest products trade gateway on the West Coast. The MTS projects proposed are specifically designed to facilitate the efficient movement of these important U.S. exports. The efficient flow of export cargoes via this gateway has a positive impact on the US balance of trade

### ***Economic Importance of Maritime Trade***

Trade is very important to the Pacific Northwest. In 2004, Washington ranked third and Oregon ranked tenth in the dollar value of exports per capita. In Washington State, the Governor's office estimates that one in three jobs is related to trade. The following economic impact estimates include jobs created by cargo handling activities and inland transportation (barge operations on the Columbia/Snake River system as well as truck and rail transportation). Summaries are presented for each region below. More detail is available in Appendix A.

#### **Lower Columbia Region**

Marine activities in the Lower Columbia River region generated 40,000 jobs in 2000 and income of \$1.8 billion, including direct, indirect and induced effects within the region. The Lower Columbia River region is expected to generate more than 52,000 total jobs in 2020, if baseline and potential market opportunities come to fruition. This would represent an increase of nearly 5,000 direct family wage jobs and an overall increase of more than 12,000 jobs in the region. Total income would be \$2.5 billion, representing an increase of more than \$700 million.

#### **Columbia/Snake River Inland Waterway Region**

The Columbia/Snake River region generated 2,600 total jobs in 2000 due to waterborne cargo activity and income of \$80 million, including direct, indirect and induced effects. The Columbia/Snake River region is expected to generate 2,900 total jobs in 2020, if baseline forecasts come to fruition. This would represent an increase of nearly 100 direct family wage jobs and an overall increase of 250 jobs in the region. Total income would be \$88 million, representing an increase of more than \$7 million.

#### **Oregon Coast Region**

The Oregon Coast region generated 3,100 total jobs in 2000 due to waterborne cargo activity, with income of \$154 million, including direct, indirect and induced effects. The Oregon Coast

region is expected to generate more than 1,300 direct jobs and nearly 4,400 total jobs in 2020, if baseline forecasts and potential market opportunities come to fruition. This would represent an increase of nearly 350 direct family wage jobs and an overall increase of 1,300 jobs in the region. Total income would be \$212 million, representing an increase of more than \$58 million.

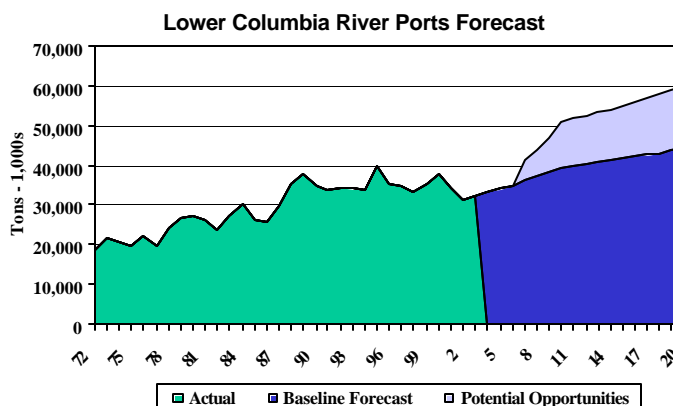
## Regional Cargo Trade Outlook

The opportunities for increased trade via Pacific Northwest ports appear to be favorable for several reasons. World economic output, which drives trade, is expected to remain strong and stable in the long-term. Most of the growth in output is occurring in countries bordering the Trans-Pacific, particularly China, India, Vietnam and other Asian countries as well as in the United States. The value of the US dollar has declined, which increases the demand for US exports. All of these factors account for favorable market conditions for ports on the Columbia/Snake River system and the Oregon Coast. Cargo forecasts are summarized below and presented in greater detail in Appendix B.

### Lower Columbia River Deep Draft Ports

Marine traffic passing the entrance of the Columbia River increased from 18 million tons in 1972 to 32 million tons in 2003, which amounts to annualized growth of 1.8%.

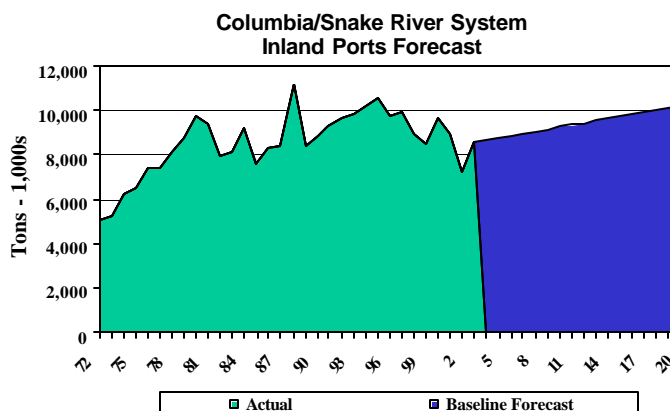
Under the baseline forecast, marine traffic is projected to continue to grow at the historic rate, to 43 million tons. This amounts to a 35 percent increase by 2020. There are several key components of trade growth to 2020 in the baseline forecast. Containers should nearly double in volume. Grain, autos and break bulk cargo are all expected to increase by about 40 percent.



If all potential market opportunities, particularly auto imports, dry bulk and grain exports, and liquefied natural gas (LNG) imports, come to fruition, marine cargo would grow at an average annual rate of 3.8% and reach 60 million tons by 2020, or an 85 percent increase over 2003.

### Columbia/Snake River Inland Ports

Traffic on the Columbia/Snake River barge system grew from 5.0 million tons in 1972 to 8.5 million tons in 2003, or at 1.8% per year. Traffic peaked in 1988 at 11.2 million tons and again in the mid-1990s at 10.5 million tons. However, volumes generally declined between 1995 and 2003 due to weak markets overseas,



the strength of the U.S. dollar and competition from railroads.

The baseline forecast projects that traffic will grow modestly, reaching 10.2 million tons by 2020, which amounts to growth of 1.1% per year. Grain and containers are the major growth commodities on the inland waterway.

Although not a subject of this study, the volume of passengers carried on cruise ships on the inland waterway has been growing dramatically. These vessels benefit from the same infrastructure maintenance and improvements as maritime cargo. They also contribute economic benefits to the port communities on the river system.

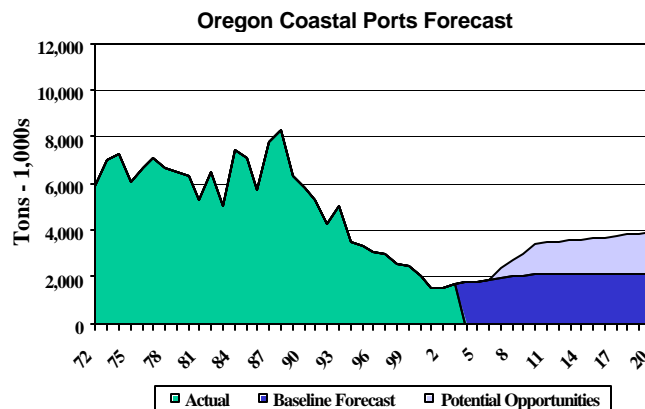
## Oregon Coast Deep Draft Ports

Oregon Coast ports have experienced a continuous decline in waterborne traffic from more than 8.0 million tons in the late 1980s to 1.7 million tons in 2003. This decline was caused by declining forest products manufacture and a shift from overseas markets accessed by water to inland markets accessed by truck and rail.

However, the worst appears to be over.

The baseline forecast expects modest growth in the existing product base, with growth to 2.1 million tons by 2020. In addition, new opportunities such as the

proposed liquefied natural gas (LNG) terminal at Coos Bay could increase cargo volumes to 3.9 million tons by 2020.



## Drivers of New MTS Infrastructure Needs

New or improved MTS infrastructure is required at locations throughout the Columbia/Snake River System and Oregon Coastal Cargo Ports region for many reasons. They include trade growth as addressed above, new logistical concepts, new transportation technology, system congestion, operating conflicts, port security requirements, and the need to repair or replace deteriorating infrastructure that has performed beyond its design life. Even in the absence of trade growth, new infrastructure is often needed simply to keep up with changing technologies, remain competitive in world markets and maintain existing trade volumes.

Some of the key drivers of new MTS infrastructure needs in the region are:

- **Trade growth** – As discussed above, the region's waterborne trade is growing and expected to grow further. Waterborne trade volumes through the region could increase by as much as 76% by 2020, from 42.2 million tons in 2003 to 74.1 million tons. While much of this trade originates or terminates in the region, a very large portion moves to and from states throughout the Mountain States, Midwest and East Coast. Increased trade for the region and the nation means more ships, trains and trucks operating in the regional transportation system, resulting in the need for increased navigation, marine terminal, rail and roadway capacity.



- **Larger ships** – Economies of scale in marine shipping have driven ship sizes and unit train lengths to be much larger over time, requiring very large cargo volumes to be transferred in a short period of time. The marine cargoes handled in the region are increasingly shipped in Panamax and, in the case of containers, post-Panamax vessels, whereas much of the region’s cargo was handled in Handysize and Handymax vessels in the past. Based on a review of ships on order, this trend toward larger vessels will continue. These larger ships require channel improvements, longer and deeper berths, larger marine terminals and higher-capacity rail and roadway systems to support their operations.

**Typical Vessel Types & Sizes**  
**Calling the Columbia/Snake River System & Oregon Coastal Cargo Ports**

| Vessel Type                                | Typical Draft | Typical Length |
|--|---------------|----------------|
| Post-Panamax Container Ships               | 45 feet       | 900-1,000 feet |
| Panamax Container Ships                    | 40-43 feet    | 750-950 feet   |
| Pure Car Carriers                          | 30-35 feet    | 550-650 feet   |
| Panamax Bulk Carriers (50-65,000 dwt)      | 40-45 feet    | 650-750 feet   |
| Handymax Bulk Carriers (35-50,000 dwt)     | 35-40 feet    | 500-650 feet   |
| Handysize Bulk Carriers (up to 35,000 dwt) | 30-35 feet    | 500-650 feet   |

- **Longer unit trains** – Just as ships are larger, unit trains have also become longer. While train lengths of 100 railcars were typical several years ago, 110-car trains are typical today and trains of 130 railcars are anticipated in the future. Panamax ships today may need to transfer 50-60,000 tons of cargo—the equivalent of 5-6 unit trains, each 1½ miles in length—within a 24-hour time frame. Accommodating the rail loop trackage, storage and transfer facilities for this scale of grain or bulk cargo operation typically necessitates upland sites of over 100 acres and as large as 130 acres for a single tenant.
- **Heavier rail cars** – The major railroads are increasing their use of newer and heavier railcars that weigh a maximum of 286,000 pounds and carry 111 tons of freight, compared with the old industry standard of 263,000-pound cars capable of hauling 100 tons. These cars are becoming the standard for the industry and the region’s shippers are demanding their use. However, these cars cause significantly more wear and tear on rail tracks and bridges and many lines cannot handle these larger cars because they have lightweight rail in place, shallow or poor ballast, and/or deferred tie maintenance.
- **New intermodal logistical concepts** – Whether it is just-in-time inventory concepts, unit train productivity or short sea shipping, new intermodal logistical concepts continue to challenge the Marine Transportation System of the region. At key locations throughout the system, new types of infrastructure or higher system productivity is needed to support these new logistical concepts and “shorten” the supply chain. Short sea shipping opportunities for the Columbia/Snake River System are discussed in Appendix C.
- **Domestic freight and passenger growth** – While import, export and waterborne trade are growing, domestic freight, rail passenger traffic and highway passenger traffic are also growing and creating demands on the shared transportation system. The combined growth and operating requirements of waterborne freight, domestic freight and passenger traffic are forcing the development of additional infrastructure capacity to support marine

trade and transportation. The impact of this combined growth is particularly significant in the I-5 corridor affecting the ports of Longview, Kalama, Vancouver and Portland.

- **System bottlenecks** – At key nodes in the Marine Transportation System, major navigation, rail or highway arterials come together to move freight throughout the region. Some of these nodes are rapidly reaching capacity and becoming system bottlenecks. In particular, rail and highway access across the Columbia River in the Vancouver-Portland area affects north-south and east-west freight mobility for ports throughout the entire region.
- **Aging infrastructure** – Throughout the region, transportation infrastructure that was built several decades ago is reaching the end of its design life and is in need of major upgrading or replacement. In addition to the physical condition of this aging infrastructure, its functionality is also often obsolete because of technological changes in transportation. The structural elements of older dams, locks, bridges, roads and rail lines are particularly susceptible to deterioration and obsolescence.



## **Toward An Integrated Marine Transportation System**

The Columbia/Snake River System and Oregon Coastal Cargo Ports MTS envisions an integrated deep water navigation, inland navigation, rail, roadway and port system that facilitates superior transportation operating efficiency for the export/import trade flowing through the region. While most proposed projects will provide efficiency and operating benefits to exporters, importers and carriers on a stand-alone basis, taken together the projects are intended to create a highly-efficient operating environment which will improve export and import competitiveness at the national, regional and local levels alike.

### ***Existing MTS Investment & Asset Base***

Port authorities, railroads, private terminal operators, state and local governments, and the federal government have made a multi-billion dollar investment in MTS infrastructure in the Columbia/Snake River System and Oregon Coastal Cargo Ports region, yet additional investment is needed. According to the 2001 MARAD Public Ports Finance Survey, the deepwater ports in the region alone, account for \$574 million in plant property and equipment investment. Even accounting for the fact that much of the roadway and rail infrastructure in the Marine Transportation System serves multiple purposes – including domestic freight and passenger traffic – the region's investment in MTS infrastructure is very large.

Despite the magnitude of the existing MTS investment and asset base, meeting the growing and shifting challenges of freight transportation and multimodal logistics requires additional investment to ensure that the MTS system keeps regional and national shippers competitive in the global market.

### ***MTS Investment Requirements***

The Columbia/Snake River System and Oregon Coastal Cargo Ports MTS identifies the need for 40 infrastructure projects throughout the region over the next 10 or more years, 34 of which are new or major rehabilitation projects and six of which are on-going maintenance programs.

The total cost of the new projects is over \$2.0 billion, including navigation, rail and roadway projects to support marine transportation and trade. Another \$300-\$350 million dollars in direct marine terminal and port security investments by port authorities is anticipated over the next 10 or more years, but not analyzed in this MTS study.

Funding requirements are anticipated to increase over time. Ongoing navigation maintenance amounts to about \$38 million per year. Near-term projects, those expected to be needed in one-to-five years, amount to nearly \$400 million. Nearly \$600 million is likely to be needed in five-to-ten years. Over \$1 billion in projects have been identified for just beyond ten years.

Funding needs vary by mode over time. The greatest identified MTS investment requirements over the next five years are for navigation, at \$238 million. Rail infrastructure will require the greatest investment in the five-to-ten year time frame, anticipated to be \$468 million over those years. Roadway improvements will require the most significant investment beyond ten years, with costs projected at more than \$1.3 billion.

While investment needs are concentrated in the Lower Columbia River area, investment is needed in all parts of the region, including Mid Columbia and Snake River ports and Oregon

Coastal cargo ports. Beyond ten years, major improvements to the I-5 and BNSF Columbia River bridges are needed, totaling \$1.1 billion.

### Summary of Total MTS Infrastructure Needs (Thousands of Dollars)

| PROJECT TYPE<br>& LOCATION  | ON-GOING<br>MAINTENANCE<br>PROJECTS* | NEW PROJECTS           |                        |                        |             |
|-----------------------------|--------------------------------------|------------------------|------------------------|------------------------|-------------|
|                             |                                      | Near Term<br>1-5 Years | Mid Term<br>6-10 Years | Long Term<br>10+ Years | Total       |
| By Infrastructure Type      |                                      |                        |                        |                        |             |
| Navigation                  | \$37,700                             | \$237,600              | 28,000                 | \$56,500               | \$322,100   |
| Rail                        | N/I                                  | \$9,400                | \$467,800              | N/I                    | \$477,200   |
| Roadway                     | N/I                                  | \$151,100              | \$77,000               | \$1,086,000            | \$1,314,100 |
| Total                       | \$37,700                             | \$398,100              | \$572,800              | \$1,142,500            | \$2,133,400 |
| By Port Region              |                                      |                        |                        |                        |             |
| Lower Columbia River        | \$20,000                             | \$181,850              | \$531,800              | \$1,142,500            | \$1,826,150 |
| Mid Columbia & Snake Rivers | \$9,400                              | \$52,950               | N/I                    | N/I                    | \$52,950    |
| Oregon Coast                | \$8,300                              | \$163,300              | \$41,000               | N/I                    | \$204,300   |
| Total                       | \$37,700                             | \$398,100              | \$572,800              | \$1,112,500            | \$2,133,400 |

\*Average annual cost

N/I – Not identified at this time, although maintenance and development needs are anticipated

### ***Regional Multi-Modal Integration***

Prioritizing MTS investment necessitates a regional multi-modal approach that views the region as a system, leverages linkages among existing and proposed projects, and recognizes the unique value of individual projects to localities and sub regions within the system.

The deep water, inland waterway, rail and roadway transportation assets in the region create an integrated, multi-modal freight transportation system that is the lifeline of the region's waterborne international trade. At key crossroads in the region, these transportation corridors converge to facilitate the transfer of goods from one mode to another – whether it is upriver, along the Oregon Coast or in the Lower Columbia River area. Several key corridors and transfer points in the region stand out as critically important when considering future MTS investments:

- **The Portland-Vancouver area** where inland waterway navigation, the BNSF and UP railroads, I-84 and I-5 meet deep water.
- **The I-5 corridor between Portland and Longview** where rail and truck freight bound for Lower Columbia River ports must contend with domestic freight and passenger traffic for vital rail and highway capacity.
- **The Mid Columbia and Snake River navigation system** which feeds waterborne trade from the region's hinterlands to downriver deep water ports.
- **The inland port system from Boardman to Lewiston** which provides truck-to-barge and rail-to-barge transfer capability for regional shippers and economic development opportunities for the Inland Empire sub region.

- **The road, rail and navigation system converging at Coos Bay** which provides waterborne trade access and unique economic development opportunities for the Southern Oregon sub region.

Future MTS funding is prioritized in this report and emphasizes navigation, rail and highway projects that remove bottlenecks, add efficiencies and enhance capacity along system corridors and key network crossroads. Taken together, the MTS projects will collectively deliver the most overall benefit to trade in the Columbia/Snake River System and Oregon Coastal Cargo Ports, the region and the nation. The projects are selected to ensure that the region's transportation infrastructure constitutes a multimodal system, the components of which are properly located and sized to accommodate the regional and national marine trade that moves through the region.

In organizing regional MTS projects into an integrated multi-modal program, the following criteria were considered:

- **System importance** – Projects were evaluated primarily as to whether they contribute to the development of the region's transportation infrastructure as a *system* and whether they accommodate national, regional or local marine trade. In doing so, several factors were evaluated including the geographic scope of the project users' and beneficiaries' locations; whether the projects benefit a single user, few users or multiple users in that geographic context; whether they benefit a single port or multiple ports in the region; and whether they are needed to complete the regional coverage of the system or, conversely, they potentially duplicate similar capacity in the region.
- **Basis of need** – Projects were also evaluated as to whether they are needed to maintain current trade volumes (e.g., by keeping up with changing transportation technology or by offsetting domestic and passenger usage of transportation capacity), to accommodate trade growth (e.g., by adding new transportation capacity) or both. Both preserving the region's ability to maintain existing trade and adding capacity for trade growth are important to the long-term economic health of the region. Maintenance must be done on an immediate, short-term basis to preserve the integrity of the system. New capacity may be developed over time.

## ***National & Regional MTS Infrastructure Needs***

Important national and regional MTS projects for the Columbia/Snake River System and Oregon Coastal Cargo Ports include 11 new navigation, rail and roadway projects totaling over \$2.0 billion plus \$38 million per year for on-going maintenance of four critical navigation links. In the next five years, the projects emphasize navigation capacity improvement and maintenance programs that are critically needed to retain existing marine trade volumes and accommodate trade growth. In the six- to ten-year timeframe, the currently identified projects focus on rail capacity improvements to facilitate rising marine-related trade volumes of national and regional origin/destination. Beyond ten years, major improvements to the I-5 and BNSF Columbia River crossings are currently identified, to accommodate trade growth in the region. These projects are summarized in the table below, followed by a more detailed discussion of each project.

## Summary of MTS Infrastructure Needs - National & Regional Projects

| Project  | Location                           | Project Type | System Importance | Basis of Need                          | Cost                            |
|--|------------------------------------|--------------|-------------------|--|---------------------------------|
| <b>On-Going Maintenance</b>                                      |                                    |              |                   |  |                                 |
| 1. Columbia & Willamette Rivers Maintenance Dredging             | Lower Columbia & Willamette Rivers | Navigation   | National          | Maintain Existing Trade                | \$20,000,000 annually           |
| 2. Snake River Maintenance Dredging                              | Snake River                        | Navigation   | Regional          | Maintain Existing Trade                | \$4-\$6,000,000 (every 3 years) |
| 3. Coos Bay Maintenance Dredging                                 | Coos Bay                           | Navigation   | Regional          | Maintain Existing Trade                | \$6,500,000 (every 2 years)     |
| 4. Mid Columbia & Snake Rivers Navigation Lock Maintenance       | Mid Columbia & Snake Rivers        | Navigation   | Regional          | Maintain Existing Trade                | \$3- \$4,000,000 annually       |
| <b>Near-Term (1-5 Years)</b>                                     |                                    |              |                   |  |                                 |
| 5. Columbia River Channel Deepening                              | Lower Columbia River               | Navigation   | National          | Maintain Existing Trade & Trade Growth | \$148,400,000                   |
| 6. Columbia River Jetty Repair                                   | Mouth of Columbia River            | Navigation   | National          | Maintain Existing Trade                | \$14,000,000                    |
| 7. Mid Columbia & Snake Rivers Navigation Lock Repair & Retrofit | Mid Columbia River                 | Navigation   | Regional          | Maintain Existing Trade                | \$51,400,000                    |
| 8. Coos Bay Harbor Improvements (2 projects)                     | Coos Bay                           | Navigation   | Regional          | Maintain Existing Trade & Trade Growth | \$23,500,000                    |
| 9. Coos Bay North Bay Industrial Rail Lead                       | Coos Bay                           | Rail         | Regional          | Trade Growth                           | \$6,800,000                     |
| 10. Upriver Unit Train Facility Feasibility Studies              | Morrow, Umatilla, Pasco, Lewiston  | Rail         | Regional          | Trade Growth                           | \$250,000                       |
| <b>Mid-Term (6-10 Years)</b>                                     |                                    |              |                   |  |                                 |
| 11. I-5 Trade Corridor Rail Capacity Improvements (10 projects)  | Portland-Vancouver                 | Rail         | National          | Trade Growth                           | \$170,000,000                   |
| 12. Kelso-Martins Bluff Third Main Line                          | Kalama-Longview                    | Rail         | National          | Trade Growth                           | \$190,000,000                   |
| 13. I-5 Delta Park to Lombard in North Portland                  | Portland                           | Highway      | Regional          | Trade Growth                           | \$44,000,000                    |
| <b>Long-Term (10+ Years)</b>                                     |                                    |              |                   |  |                                 |
| 14. I-5 Columbia River Crossing                                  | Portland-Vancouver                 | Highway      | Regional          | Trade Growth                           | \$1,000,000,000                 |
| 15. BNSF Rail Bridge Navigation Lift Span                        | Portland-Vancouver                 | Navigation   | Regional          | Maintain Existing Trade                | \$56,500,000                    |

### National & Regional MTS Projects – On-Going Maintenance

Four key navigation links throughout the region require annual maintenance funding that averages \$38 million per year. All of these are navigation projects needed to retain existing trade and maintain the ancillary benefits of waterborne transportation for the region.

### ***Columbia & Willamette Rivers Maintenance Dredging***

The Columbia and Lower Willamette channel project requires regular dredging to maintain authorized depths. Although funded by a national user fee, maintenance is the responsibility of the federal government and requires annual appropriations. Factors in addition to funding may affect the ability of the government to perform required maintenance. For instance, the Lower Willamette River has not been dredged for several years due to ongoing Superfund remediation.

### ***Snake River Maintenance Dredging***

Routine channel maintenance is required to provide a 14-foot depth throughout the designated federal navigation channel in the project area, and to restore access to selected port berthing areas. Sediment is deposited in the navigation channel primarily during spring runoff periods. Because channel maintenance has not occurred since 1998-1999, shoaling in the navigation channel has become critical in some locations, and is now as shallow as 8.5 feet and 10.6 feet near the Ports of Clarkston and Lewiston, respectively. Also, the total surface area of the navigation channel having depths less than 14 feet in the Snake/Clearwater rivers confluence area has risen from approximately 38 acres in 2003 to approximately 52 acres in 2004.

### ***Coos Bay Harbor Maintenance***

Coos Bay Maintenance Dredging is needed to maintain the existing harbor at its federally-authorized depth in order to retain existing waterborne trade volumes. Because of Coos Bay's southern Oregon coastal location and its rail and highway connections to the I-5 corridor and beyond, the navigation projects at Coos Bay benefit a large part of the region that does not otherwise benefit from Columbia and Snake River corridor improvements.

### ***Mid Columbia & Snake Rivers Navigation Lock Maintenance***

Navigation locks on the Mid Columbia and Snake Rivers are required for any vessel to navigate the river. These locks require annual maintenance. The Walla Walla District, U.S. Army Corps of Engineers is responsible for maintenance of McNary Dam and Snake River dam locks. The Portland District is responsible for the remaining Columbia River locks. Each district usually schedules lock closures for a few days each year to perform inspection and maintenance.

## **National & Regional MTS Projects – 1-5 years**

Six key projects throughout the region totaling approximately \$244 million are identified as national or regional MTS projects in the next 1-5 years. Most of these are navigation improvements needed to retain existing trade and accommodate future trade growth.

### ***Columbia River Channel Deepening***

Deepening of the Columbia River shipping channel from Portland/Vancouver to the mouth of the Columbia River has long been recognized as a strategic investment that will benefit the entire region. Given the interconnectedness of downriver deep water ports and upriver inland ports by barge and other modes, this project will improve the competitiveness of virtually every port in the Columbia-Snake river system. Channel deepening is needed to maintain existing trade by keeping pace with larger ship sizes and to accommodate trade growth on larger ships. The project has been endorsed by a very broad array of governmental, civic and business organizations including virtually all Lower Columbia River deep draft ports and Columbia/Snake

River upriver ports. Deepening has received Congressional authorization and funding commitments from Oregon and Washington to meet local cost sharing requirements. Federal funding of approximately \$75 million is needed to complete the project.

### ***Columbia River Jetty Repair***

The jetties that protect and ensure that the mouth of the Columbia River is safe for navigation have been steadily deteriorating over the last several decades and are currently in urgent need of repair. Of primary concern are critical portions of the North Jetty (Washington) and the South Jetty (Oregon), which could breach during a large storm event, thus allowing sand to be transported and deposited directly into the navigation channel. Such an event would impact commercial and recreational navigation at the mouth of the river and require emergency measures to repair the jetty and restore the channel depth.

The initial 4.5-mile section of The South Jetty at the mouth of the Columbia River was completed in 1896, with a 2.4-mile extension completed in 1914. Eight subsequent repairs have also been completed (last one in 1982). Jetty stone placement at the South Jetty, to date, totals approximately 8.7 million tons. Approximately 0.8 mile of the outer tip of the jetty has eroded since initial construction and is no longer functional. The 2.5-mile long North Jetty was completed in 1917, to help stabilize shoaling at the mouth of the river. Two subsequent repairs have been made, with the last one completed in 1965. Jetty stone placement at the North Jetty, to date, totals approximately 3.4 million tons. Approximately 0.2 mile of the tip of the North Jetty has eroded since initial construction and is no longer functional.

### ***Mid Columbia & Snake Rivers Navigation Lock Repair & Retrofit***

Four hydroelectric dams are on the Columbia River between the Portland-Vancouver area and the Snake River junction: Bonneville; The Dalles; John Day; and McNary. The youngest of these – John Day – was completed in 1971. All dams need investment for upgrades, repair and/or safety. In some instances, studies are needed before improvements can be implemented.

Requirements are:

- Bonneville – North lock wall stabilization and replacement of spillway power distribution equipment (\$6.65M)
- The Dalles – Navigation lock upgrade (\$0.3M)
- John Day – Lock and foundation leaks, new lock gate (\$20.3M)
- McNary – Rehab of lock electrical system (\$4.0 M); future restoration of downstream lock gate (\$7.0 M)

Four hydroelectric dams are on the lower Snake River between Lewiston-Clarkston and the river's confluence with the Columbia at Pasco, Washington: Ice Harbor, Lower Monumental; Little Goose, and Lower Granite. The youngest of these – Lower Granite – came on line in 1975. Near term required repairs include:

- Ice Harbor – Replacement of upstream lock gate (\$3.5M)
- Lower Monumental – Replacement of upstream and downstream lock gates (\$11.1M)
- Little Goose – Rehabilitation of downstream gate (\$3.5M)
- Lower Granite – Minor maintenance and upgrades (\$1.0\_M)

### ***Coos Bay Harbor Improvements***

The Coos Bay Harbor Improvements involve two separate projects – jetty repair (\$18.7M) and a new Lower Bay turning basin (\$4+M) – that are critical to maintaining existing forest products trade and accommodating trade growth, including a proposed liquefied natural gas (LNG) import terminal. The jetty repair is needed to maintain the existing harbor entrance in order to maintain existing waterborne trade volumes. The new turning basin will accommodate navigation operations in the Lower Bay – where no turning basin currently exists – for an existing forest products terminal, a proposed LNG import terminal and future tenants of the Port’s 113-acre North Bay Marine Industrial Park, which was recently master planned for marine cargo and industrial uses. Because of Coos Bay’s southern Oregon coastal location and its rail and highway connections to the I-5 corridor and beyond, improvements at Coos Bay will benefit a large part of the region that does not otherwise benefit from Columbia and Snake River corridor improvements. The projects are supported by the Port of Coos Bay and the Oregon Economic and Community Development Department.

### ***Coos Bay North Bay Industrial Rail Lead***

This four-mile rail project will extend rail service to Coos Bay’s North Bay Marine Industrial Park. The rail line will accommodate trade growth in southwest Oregon by providing service for a new sawmill with multimodal ocean barge, rail and highway access, as well as other future marine industrial tenants and marine cargo projects. As with navigation, rail improvements at Coos Bay will benefit a large part of the region. The project is supported by the Port of Coos Bay, ODOT and the Central Oregon & Pacific Railroad (CORP).

### ***Upriver Unit Train Facility Feasibility Studies***

Four upriver ports – Morrow, Umatilla, Pasco and Lewiston – have identified the potential need for unit train rail facilities to support rail-barge movements of grain to downriver export elevators or to shuttle cargo to downriver or other deep water ports as a supplement to barge. Because of the integrated nature of upriver and downriver ports, these logistical concepts present the potential for new regional transportation benefits, especially for trade growth as downriver rail and highway capacity becomes more fully utilized. Before construction of the proposed projects is undertaken, feasibility assessments are recommended to test the engineering and economic viability of the concepts at the four ports and to address regional benefits. The projects have been endorsed by the Oregon Shortline Association and Oregon Rail Users League (Morrow); the Port of Umatilla and the ODOT Rail Division (Umatilla); the Port of Pasco and Franklin County CERT (Pasco); and the Port of Lewiston (Lewiston).

## **National & Regional MTS Projects – 6-10 Years**

Three major transportation improvements totaling \$404 million – two rail projects and one highway project – are currently identified as national or regional MTS projects for the 6-10 year time frame. These projects will be needed primarily to accommodate trade growth as capacity in each area is reached in the next several years.

### ***I-5 Trade Corridor Rail Capacity Improvements***

This group of 10 rail capacity projects in the Portland-Vancouver area is recognized as a strategic freight transportation improvement program that will benefit the entire region and



facilitate higher trade volumes and greater efficiency for port-related traffic. Virtually all rail-related traffic handled at Columbia River deep water ports on the Burlington Northern Santa Fe, Union Pacific and Portland & Western railroads must pass through the Portland-Vancouver rail system, including the ports of Portland, St. Helens, Vancouver, Kalama and Longview. The combination of domestic rail freight growth, rail passenger growth and port-related rail freight growth transiting the Portland-Vancouver area has begun to put severe pressure on the region's rail capacity at this key system crossroad, causing bottlenecks and delays. The 10 projects, which should be viewed as an integrated capacity improvement program, are:

- Vancouver Yard Bypass (\$55.0M)
- Increased Track Speeds Across the Movable River Spans (\$8.0M)
- Revised Crossovers at UP/BNSF North Portland Junction (\$9.2M)
- Ramsey Yard & Barnes Yard Rail Improvements (\$25.1M)
- UP Kenton Mainline Improvements (\$25.4M)
- UP Graham Line Connection to Southbound Brooklyn Line (\$11.0M)
- Increased Track Speeds Between UP Willsburg Junction & Albina Yard (\$8.8M)
- Extension of Two Main Tracks from Willsburg Junction to Clackamas (\$17.3M)
- Upgraded River Lead Through Albina Yard (\$3.0M)
- Added Controlled Siding on UP Graham Line West of Troutdale (\$6.9M)

The program has been endorsed by the Port of Portland, Port of Vancouver, ODOT, WSDOT, Metro (Portland), RTC (Vancouver), City of Portland, City of Vancouver, BNSF, UP and Amtrak.

### ***Kelso-Martins Bluff Third Main Line***

This project calls for construction of a third rail main line along a 19-mile corridor between Woodland and Kelso, WA, including a new Toteff Road overpass or underpass at the Port of Kalama. The project will add rail capacity and efficiency for regional trade growth at the ports of Kalama and Longview for east-west traffic and Kalama, Vancouver and Portland for north-south traffic. As with the I-5 Trade Corridor Rail Improvements, growth in domestic rail freight, rail passenger traffic and port-related rail freight has begun to put significant pressure on the region's rail capacity in this corridor. In addition, local unit grain train handling conflicts with main line traffic and insufficient rail storage capacity is available to support grain trains. The Kelso-Martins Bluff Third Main Line will alleviate projected capacity problems and provide facilities for more efficient unit grain train operations at downriver ports. The project is supported by the Port of Kalama and WSDOT.

### ***I-5 Delta Park to Lombard in North Portland***

Interstate highway capacity on I-5 southbound between the Columbia River Bridge and Lombard in North Portland is limited due to its poor lane capacity and configuration. Much of the region's truck traffic to and from the ports of Portland, St. Helens, Vancouver, Kalama and Longview must pass over this stretch of the interstate highway system where bottlenecks and delays occur. Consequently, the existing capacity to handle much of the region's highway-related marine trade is limited and future capacity for trade growth is significantly constrained. The project is endorsed by the Portland/ Vancouver I-5 Transportation and Trade Partnership, including the Port of Portland, Port of Vancouver, ODOT, WSDOT, Metro (Portland), RTC (Vancouver), City of Portland, City of Vancouver, Tri-Met and C-Tran.

## **National & Regional MTS Projects – 10+ years**

Two key transportation projects are currently identified as MTS funding requirements for the 10+ year time frame – the I-5 Columbia River Crossing, and a revised lift span on the BNSF rail bridge to accommodate navigation.

### ***I-5 Columbia River Crossing***

Interstate highway capacity on I-5 at the Columbia River Bridge is severely limited by a number of factors including poor lane capacity, narrow lanes and lift span operations to accommodate navigation. Much of the region's truck traffic to and from the ports of Portland, St. Helens, Vancouver, Kalama and Longview must pass over the Interstate Bridge where bottlenecks and delays occur. As a result of this bottleneck, the efficiency of handling existing waterborne trade by highway is reduced and capacity for trade growth is severely limited. Alternatives for a new interstate bridge crossing have been under study for some time to provide a high capacity long-term solution at this critical regional crossroad. The project is endorsed by the Portland/Vancouver I-5 Transportation and Trade Partnership, including the Port of Portland, Port of Vancouver, ODOT, WSDOT, Metro (Portland), RTC (Vancouver), City of Portland, City of Vancouver, Tri-Met and C-Tran.

### ***BNSF Rail Bridge Navigation Lift Span***

The BNSF railroad bridge across the Columbia River is located 5,000 feet downstream from the I-5 Interstate Bridge. The rail bridge includes a swing span near the Washington side of the river while the Interstate Bridge includes a lift span near the Washington side and a high fixed span near the center of the river. Current navigation operations require barge tows to execute an “S” turn between the fixed span of the I-5 Bridge and the swing span of the rail bridge to avoid stopping freeway traffic while the lift span is opened. The current configuration of bridge spans and operations creates a safety issue for navigation or, alternatively, a congestion issue for freeway traffic. This project would construct a new lift span in the BNSF bridge toward the center of the river to allow safer navigation operations as well as a third track to add rail capacity. The Portland/Vancouver I-5 Transportation and Trade Partnership endorses the project and the U.S. Coast Guard conducted a Truman-Hobbs Act investigation; however, the U.S. Coast Guard Administrator declined Truman-Hobbs funding for the project.

## ***Local MTS Infrastructure Needs***

In addition to the national and regional MTS projects presented in the previous section, 22 MTS projects are of local importance in supporting marine trade and transportation in the Columbia/Snake River System and Oregon Coastal Cargo Ports region. These projects are listed below. They include three navigation projects, ten rail projects and nine roadway projects. A complete list of local MTS projects is shown below.

## MTS Infrastructure Needs - Local Projects

| Project  | Location           | Project Type | System Importance | Basis of Need           | Cost                         |
|--|--------------------|--------------|-------------------|-------------------------|------------------------------|
| <b>On-Going Maintenance</b>                            |                    |              |                   |                         |                              |
| Newport Harbor Maintenance Dredging                    | Newport            | Navigation   | Local             | Maintain Existing Trade | \$1,800,000                  |
| <b>Near-Term (1-5 Years)</b>                           |                    |              |                   |                         |                              |
| Pasco Processing Center Road Connection to SR395       | Pasco              | Road         | Local             | Trade Growth            | \$300,000                    |
| US20 Pioneer Mountain to Eddyville                     | Newport            | Road         | Local             | Trade Growth            | \$133,000,000                |
| Umatilla Terminal Access Road Improvements             | Umatilla           | Road         | Local             | Trade Growth            | \$1,000,000                  |
| Columbia Blvd. & Lombard St. Improvements at MLK       | Portland           | Road         | Local             | Trade Growth            | \$16,800,000                 |
| Scappoose Bay Marine Park Channel Deepening            | Port of St. Helens | Navigation   | Local             | Trade Growth            | \$300,000                    |
| <b>Mid-Term (6-10 Years)</b>                           |                    |              |                   |                         |                              |
| Repair/Replace Coos River Rail Bridge                  | Coos Bay           | Rail         | Local             | Maintain Existing Trade | \$10,000,000+                |
| Yaquina Bay Jetty Repair                               | Newport            | Navigation   | Local             | Maintain Existing Trade | \$28,000,000                 |
| Kalama Grain Terminal Trackage Improvements            | Kalama             | Rail         | Local             | Trade Growth            | \$2,500,000                  |
| Leadbetter St. Extension & Rail Overcrossing           | Portland           | Rail         | Local             | Trade Growth            | \$10,800,000                 |
| North Rivergate A&B Rail Yard Expansion                | Portland           | Rail         | Local             | Trade Growth            | \$4,500,000                  |
| Coos Bay North Bay Marine Terminal Rail infrastructure | Coos Bay           | Rail         | Local             | Trade Growth            | \$3,000,000                  |
| New Port of Vancouver Northern Rail Access             | Vancouver          | Rail         | Local             | Trade Growth            | \$60,000,000 to \$80,000,000 |
| West 26 <sup>th</sup> Roadway Extension                | Vancouver          | Road         | Local             | Trade Growth            | \$20,000,000                 |
| Fruit Valley Road, Phase 3                             | Vancouver          | Road         | Local             | Trade Growth            | \$10,000,000                 |
| Port Westward Industrial Rail Loop                     | Port of St. Helens | Rail         | Local             |                         | \$1,800,000                  |
| Multnomah Plywood Industrial P Park Rail siding        | Port of St. Helens | Rail         | Local             |                         | \$250,000                    |
| Railroad Avenue/Pole Yard Rail Upgrade                 | Port of St. Helens | Rail         | Local             |                         | \$150,000                    |
| Columbia City Rail Siding Upgrade                      | Port of St. Helens | Rail         | Local             |                         | \$150,000                    |
| Chapman Landing Access Road Improvement                | Port of St. Helens | Road         | Local             | Trade Growth            | \$3,000,000                  |
| <b>Long-Term (10+ Years)</b>                           |                    |              |                   |                         |                              |
| Fourth Plain Expansion                                 | Vancouver          | Road         | Local             | Trade Growth            | \$30,000,000                 |
| Columbia Blvd. Northbound Ramps to I-5                 | Portland           | Road         | Local             | Trade Growth            | \$56,000,000                 |